

## **Preliminary Report on Deep Water Hydrozoan Species Collected from the Pacific Ocean off Northern Japan**

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**Abstract:** Hydrozoan specimens gathered by bottom trawl from various depths (between ca. 250-2000 m) in the Pacific Ocean off northern Japan have disclosed twenty species (one included in Athecata, 19 in Thecata) identified to date. Noteworthy among the species collected was the wide bathymetric distribution of *Hydractinia* sp.

**Key words:** Hydrozoa, Cnidaria, Pacific Ocean, northern Japan.

### **Introduction**

A faunal survey project “Research on Deep-sea Fauna and Pollutants off Pacific Coast of Northern Japan” undertaken by the National Museum of Nature and Science, Tokyo, was conducted from 2005 to 2008 (Saito *et al.*, 2009). During the survey, many cnidarians, including hydrozoan species, were obtained from various depths (between ca. 250-2000 m) by bottom trawls.

Because the deep-sea hydrozoan fauna of this region is still poorly known, a preliminary account with species’ identifications is presented here.

### **Materials and Methods**

Cnidarians, including hydrozoa and anthozoa, were collected together with a large assortment of other benthic material, at many sampling stations using trawls and biological dredges (Table 1), operated by the R/V *Wakataka-maru* of the Fisheries Research Agency (FRA) from 2005 to 2007 and the R/V *Tansei-maru* of the Japan Marine Science and Technology Center (JAMSTEC) in 2007 (Fig. 1A). Hydrozoan specimens observed on substrata (for example, shells, rocks and discarded rope) were collected from the assortment of benthic materials. Small detached specimens of hydrozoa were picked out from the remaining rubble (Fig. 1B). Specimens were fixed in 10% formalin solution on the research vessels and preserved in ca. 75% ethanol in the laboratory immediately after each cruise.

### **Results and Discussion**

Twenty hydrozoan species have been recorded so far (Table 2), based on specimens collected primarily at 28 sampling stations. A total of 58 specimens of the athecate hydroid *Hydractinia*, each characterized by hydrorhizas with serrated spines (Fig. 2A), upon which the provisional identifications were based, were collected from a number of stations at varying depths during the survey, although other thecate hydroid species were collected much less often (once or twice).

*Hydractinia* sp. has already been reported from about 70 m depth in the same region by Na-

Table 1. Collection data for hydrozoan specimens obtained from the Pacific Ocean off northern Japan during 2005–2007.

\* WA: R/V *Wakataka-maru*, KT: R/V *Tansei-maru*.

Haul no.*	Date	Sampling gear	Position in	Position out	Depth (m)
WA-05-E480	2005.10.25	Otter trawl	38°22.6'N, 142°05.3' E	38°20.9'N, 142°06.0' E	482-483
WA-05-E510	2005.10.25	Otter trawl	38°22.5'N, 142°06.3' E	38°23.6'N, 142°05.8' E	514-505
WA-05-E550	2005.10.26	Otter trawl	38°22.6'N, 142°07.3' E	38°23.6'N, 142°07.5' E	545-561
WA-05-E650	2005.10.26	Otter trawl	38°23.0'N, 142°10.7' E	38°21.8'N, 142°10.6' E	658-657
WA-05-E900	2005.10.26	Otter trawl	38°28.9'N, 142°21.4' E	38°29.7'N, 142°21.6' E	900-904
WA-05-F425	2005.10.27	Otter trawl	37°44.3'N, 141°54.8' E	37°42.5'N, 141°55.0' E	424-424
WA-05-F450	2005.10.27	Otter trawl	37°43.6'N, 141°56.6' E	37°45.3'N, 141°56.4' E	449-449
WA-05-F480	2005.10.27	Otter trawl	37°41.9'N, 141°59.0' E	37°40.2'N, 141°59.0' E	484-480
WA-05-F510	2005.10.27	Otter trawl	37°39.4'N, 142°01.2' E	37°38.2'N, 142°01.1' E	508-506
WA-05-F550	2005.10.27	Otter trawl	37°41.0'N, 142°04.7' E	37°42.0'N, 142°04.0' E	551-546
WA-05-G250	2005.10.29	Otter trawl	36°58.3'N, 141°25.6' E	36°57.0'N, 141°24.8' E	251-255
WA-05-G350	2005.10.29	Otter trawl	36°56.3'N, 141°30.9' E	36°58.0'N, 141°31.5' E	373-356
WA-05-H280	2005.10.30	Otter trawl	36°29.4'N, 140°59.1' E	36°30.8'N, 141°00.2' E	277-281
WA-05-H380	2005.11.1	Otter trawl	36°29.1'N, 141°00.8' E	36°30.0'N, 141°01.7' E	380-384
WA-05-H900	2005.11.2	Otter trawl	36°30.9'N, 141°21.0' E	36°30.4'N, 141°20.3' E	900-899
WA-05-G410	2005.11.3	Otter trawl	36°56.8'N, 141°33.3' E	36°58.1'N, 141°34.4' E	411-411
WA-05-G750	2005.11.10	Otter trawl	36°46.2'N, 141°35.4' E	36°45.6'N, 141°34.8' E	750-750
WA-06-1200	2006.-.-	ND	ND	ND	1200
WA-06-530	2006.-.-	ND	ND	ND	530
WA-06-380	2006.-.-	ND	ND	ND	380
WA-07-A250D	2007.10.6	Biological dredge	40°51.0'N, 141°51.2' E	40°50.9'N, 141°51.5' E	258-258
WA-07-C350D	2007.10.15	Biological dredge	39°44.2'N, 142°16.9' E	39°44.4'N, 142°16.9' E	355-354
WA-07-D210D	2007.10.18	Biological dredge	38°57.4'N, 141°59.7' E	38°57.7'N, 141°59.9' E	213-213
KT-07-29-M-3-1	2007.11.5	Beam trawl	39°20.0'N, 142°51.0' E	39°21.8'N, 142°51.9' E	1728-1719
KT-07-29 M-3-2	2007.11.6	Beam trawl	39°20.2'N, 142°51.4' E	39°19.2'N, 142°49.2' E	1737-1709
KT-07-29 K-2	2007.11.7	Beam trawl	42°30.3'N, 144°50.5' E	42°30.6'N, 144°52.2' E	1535-1543
KT-07-29 E-3	2007.11.7	Beam trawl	41°39.1'N, 144°07.5' E	41°37.2'N, 144°07.6' E	1997-2043
KT-07-29 H-1	2007.11.8	Beam trawl	40°48.7'N, 142°00.1' E	40°47.4'N, 142°00.5' E	497-454

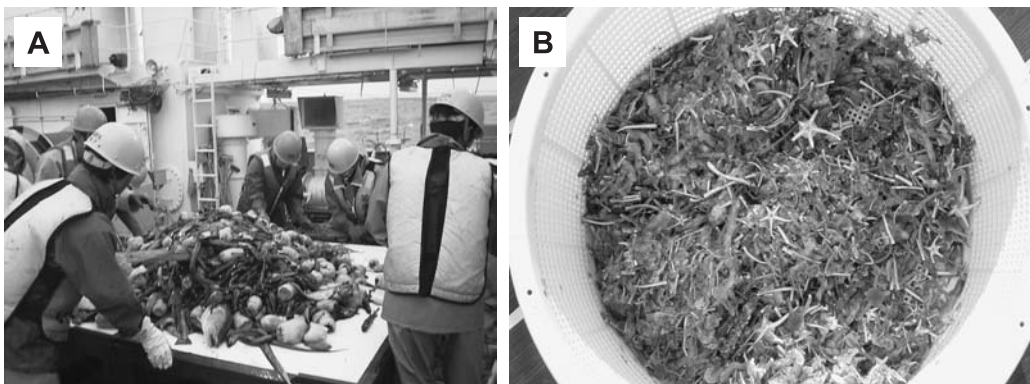


Fig. 1. Specimens caught by an otter trawl from R/V *Wakataka-maru*. A, a pile of marine animals, including gastropod shells with hydrozoan species and large sea anemones, such as *Actinostola carlgreni* and *Liponema multicornis* (photo: Dr. Narimatsu); B, small specimens separated in a basket.

mikawa (1994), but is now known to occur in depths from 70–2000 m off northern Japan. Elsewhere, *Hydractinia* species have been reported from limited substrata and depths in Japan (for example, Stechow, 1909; Goto, 1910; Yamada, 1959; Nagao, 1961; Hirohito, 1988). The wide bathymetric distribution of *Hydractinia* sp., depending on several substrata in accordance with

Table 2. List of hydrozoan species collected from the Pacific Ocean off northern Japan during 2005-2007.

Species	Depth	Haul no.
Order Athecata		
Family Hydractiniidae		
<i>Hydractinia</i> sp.	ca. 250-2000 m	WA-05-E510, WA-05-E550, WA-05-E650, WA-05-E900, WA-05-F425, WA-05-F450, WA-05-F480, WA-05-F510, WA-05-G250, WA-05-H280, WA-05-H380, KT-07-29-E3, KT-07-29-M-3-2
Order Thecata		
Family Haleciidae		
<i>Halecium beanii</i> (Johnston, 1847)	506-508 m	WA-05-F510
<i>Halecium crinis</i> Stechow, 1913	449 m	WA-05-F450
<i>Halecium</i> sp.	1709-1734 m	KT-07-29-M-3-2
Family Campanulariidae		
<i>Campanularia verticillatus</i> Linnaeus, 1758	454-497 m	KT-07-29-H-1
<i>Clytia</i> sp.	1200 m	WA-06-1200
<i>Obelia bicuspidata</i> Clark, 1875	750 m	WA-05-G750
Family Campanulinidae		
<i>Stegolaria</i> sp.	530 m	WA-06-530
Family Lafoeidae		
<i>Acryptolaria</i> sp. cf. <i>A. conferta</i> (Allman, 1877)	352-346 m	WA-05-G350
<i>Cryptolaria exserta</i> Busk, 1858	354-355 m	WA-07-C350D
<i>Grammaria immersa</i> Nutting, 1901	546-561 m	WA-05-E550
<i>Lafoea benthophila</i> Ritchie, 1909	546-551 m	WA-05-F550
<i>Lafoea dumosa</i> (Fleming, 1820)	258 m	WA-07-A250D
<i>Lafoea</i> sp.	1709-1734 m	KT-07-29-M-3-1, KT-07-29-M-3-2
<i>Zygophylax</i> sp.	899-900 m	WA-05-H900
Family Bonneviellidae		
<i>Bonneviella</i> sp.	1535-1543 m	KT-07-29-K-2
Family Sertulariidae		
<i>Sertularella</i> sp.	380 m	WA-06-380
<i>Symplectoscyphus</i> sp. cf. <i>S. tricuspoidatus</i> (Alder, 1856)	ca. 210-550 m	WA-05-E480, WA-05-E550, WA-05-F450, WA-05-F550, WA-05-G410, WA-07-D210D
<i>Thuiaria</i> sp.	346-352 m	WA-05-G350
Family Plumulariidae		
<i>Halopteris</i> sp.	1200 m	WA-06-1200

depth, is noteworthy.

Colonies of *Hydractinia* sp. were collected from gastropod shells (Buccinidae) (Fig. 2), a number of the latter also being inhabited by hermit crabs. Although the complete picture is unclear, it may be that colonies of this hydroid have secured a stable niche based on the continual use of gastropod shells as substrata, relying on a continuity of new hermit crab hosts. Accordingly, colonies of *Hydractinia* sp. have become widely distributed in the extensive depths of the Pacific Ocean off northern Japan, despite the relative lack of hard substrata.

On the other hand, specimens of nineteen thecate species were collected from discarded ropes or in detached condition from substrata, making any discussion of their bathymetric distribution

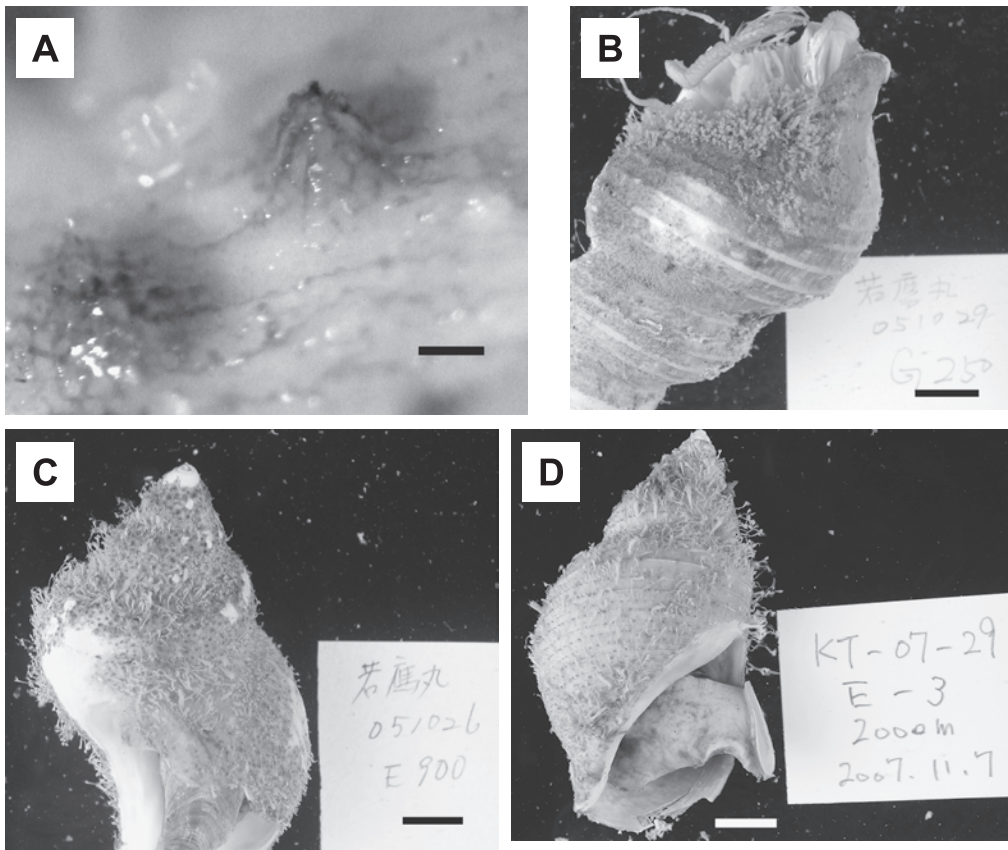


Fig. 2. *Hydractinia* sp. A, hydrorhizas with serrated spines; B, a specimen collected from WA-05-G250 (ca. 250 m in depth); C, a specimen collected from WA-05-E900 (ca. 900 m in depth); D, a specimen collected from KT-07-29-E-3 (ca. 2000 m in depth). Scales: 0.2 mm for A, 1 cm for B-D.

difficult.

### Acknowledgements

I wish to express my gratitude to the crews of the R/V *Wakataka-maru* (FRA) and R/V *Tan-sei-maru* (JAMSTEC) for their help in collecting specimens, and am very grateful for the generosity of Drs. Shigeaki Kojima (The University of Tokyo) and Yoji Narimatsu (FRA). I also thank Dr. Graham Hardy, Ngunguru, New Zealand, for his critical revision of the manuscript.

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